

WHAT IS CLAIMED IS:

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1. A wiper suitable for use in a cleanroom environment and being constructed at least partly of a textile fabric having a machine direction and a cross-machine direction, said fabric being formed from a multiplicity of yarns including thermoplastic filaments, the wiper comprising: an interior and a plurality of perimeter edges disposed in surrounding relation to the interior and at least one discontinuous fused border zone disposed inboard of and extending substantially parallel to at least one of the perimeter edges,
- 5 wherein said discontinuous fused border zone comprises a plurality of substantially discrete fusion points formed by localized melt fusion of said thermoplastic filaments such that said discrete fusion points are disposed within a matrix of unmelted material.
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- 15 2. The wiper according to claim 1, wherein said thermoplastic filaments are polyester.
3. The wiper according to claim 2, wherein said textile fabric is formed substantially entirely of polyester.
- 20 4. The wiper according to claim 3, wherein said textile fabric is subjected to heat setting at a temperature of from 180 to 300 degrees Fahrenheit and wherein said yarns have not been heated above a temperature of 300 degrees Fahrenheit.
- 25 5. The wiper according to claim 3, wherein said polyester is substantially free of inorganic ionic additives such that complete combustion of said polyester, yields an ash content of not greater than about zero to about 0.1% of the initial weight of said polyester.

6. The wiper according to claim 5, wherein said textile fabric is selected from the group consisting of knit fabric, woven fabric and nonwoven fabric.

5 7. The wiper according to claim 6, wherein the yarns forming the textile fabric have a linear density in the range of about 15 to about 250 denier.

10 8. The wiper according to claim 7, wherein said substantially discrete fusion points within said discontinuous fused border zone are ultrasonically induced.

15 9. The wiper according to claim 7, wherein said substantially discrete fusion points are of elongate geometry arranged in end to end relation in a plurality of rows extending substantially parallel to said perimeter edge.

20 10. The wiper according to claim 9, wherein the discrete fusion points are staggered in relation to the discrete fusion points in adjacent rows such that a brickwork pattern is formed.

25 11. The wiper according to claim 1, wherein the wiper is quadrilateral in configuration and wherein a first discontinuous fused border zone is disposed inboard of and substantially parallel to a first perimeter edge and wherein a second discontinuous fused border zone is disposed inboard of and substantially parallel to a second perimeter edge in opposing relation to said first perimeter edge.

30 12. The wiper according to claim 11, wherein the first and second perimeter edges extend in the cross-machine direction of the textile fabric.

13. The wiper according to claim 11, wherein a third discontinuous

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fused border zone is disposed inboard of and substantially parallel to a third perimeter edge and wherein a fourth discontinuous fused border zone is disposed inboard of and substantially parallel to a fourth perimeter edge in opposing relation to said third perimeter edge.

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14. The wiper according to claim 13, wherein the first and second perimeter edges extend in the cross-machine direction of the textile fabric and wherein the third and fourth perimeter edges extend in the machine direction of the textile fabric.

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15. A wiper suitable for use in a cleanroom environment and being constructed at least partly of a textile fabric having a machine direction and a cross-machine direction, said fabric being formed from a multiplicity of yarns including thermoplastic filaments, the wiper comprising: an interior and a plurality of perimeter edges disposed in surrounding relation to the interior wherein at least one of said perimeter edges comprises a folded double layer border and a fused attachment zone disposed inboard of the folded double layer border, wherein said fused attachment zone is formed by melt fusion of said thermoplastic filaments.

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16. The wiper according to claim 15, wherein said thermoplastic filaments are polyester.

17. The wiper according to claim 16, wherein said textile fabric is formed substantially entirely of polyester.

18. The wiper according to claim 17, wherein said textile fabric is subjected to heat setting at a temperature of from 180 to 300 degrees Fahrenheit and wherein said yarns have not been heated above a temperature of 300 degrees Fahrenheit.

19. The wiper according to claim 17, wherein said polyester is

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substantially free of inorganic ionic additives such that complete combustion of said polyester, yields an ash content of not greater than about zero to about 0.1% of the initial weight of said polyester.

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20. The wiper according to claim 19, wherein said textile fabric is selected from the group consisting of knit fabric, woven fabric and nonwoven fabric.

10 21. The wiper according to claim 20, wherein the yarns forming the textile fabric have a linear density in the range of about 15 to about 250 denier.

15 22. The wiper according to claim 21, wherein said fused attachment zone is ultrasonically induced.

20 23. The wiper according to claim 15, wherein said fused attachment zone comprises a plurality of substantially discrete fusion points formed by localized melt fusion of said thermoplastic filaments such that said discrete fusion points are disposed within a matrix of unmelted material.

25 24. The wiper according to claim 23, wherein said substantially discrete fusion points are of elongate geometry arranged in end to end relation in a plurality of rows extending substantially parallel to said double layer border.

30 25. The wiper according to claim 24, wherein the discrete fusion points are staggered in relation to the discrete fusion points in adjacent rows such that a brickwork pattern is formed.

26. The wiper according to claim 15, wherein the wiper is

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quadrilateral in configuration and wherein a first folded double layer border defines a first perimeter edge and wherein a second folded double layer border defines a second perimeter edge in opposing relation to said first perimeter edge.

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27. The wiper according to claim 26, wherein the first and second perimeter edges extend in the machine direction of the textile fabric.

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28. The wiper according to claim 26, wherein a third folded double layer border defines a third perimeter edge and wherein a fourth folded double layer border defines a fourth perimeter edge in opposing relation to said third perimeter edge.

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29. A wiper suitable for use in a cleanroom environment and being constructed at least partly of a textile fabric having a machine direction and a cross-machine direction, said fabric being formed from a multiplicity of yarns including thermoplastic filaments, the wiper comprising: an interior and four perimeter edges disposed in surrounding relation to the interior wherein at least one of said perimeter edges comprises a folded double layer border and 20 a fused attachment zone disposed inboard of the folded double layer border, wherein said fused attachment zone is formed by melt fusion of said thermoplastic filaments and wherein at least one other of said perimeter edges comprises a thermally sealed edge and a discontinuous fused border zone extending inwardly from said thermally sealed edge wherein said 25 discontinuous fused border zone comprises a plurality of substantially discrete fusion points formed by localized patterned melt fusion of said thermoplastic filaments such that said discrete fusion points are disposed within a matrix of unmelted material.

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30. The wiper according to claim 29, wherein the wiper is of substantially right-angled quadrilateral configuration and wherein a first discontinuous fused border zone is disposed inboard of and substantially

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parallel to a first perimeter edge and wherein a second discontinuous fused border zone is disposed inboard of and substantially parallel to a second perimeter edge in opposing relation to said first perimeter edge and wherein a first folded double layer border defines a third perimeter edge extending
5 between said first perimeter edge and said second perimeter edge and wherein a second folded double layer border defines a fourth perimeter edge in opposing relation to said third perimeter edge.

31. The wiper according to claim 30, wherein the first and second
10 perimeter edges extend in the cross-machine direction of the textile fabric and wherein the third and fourth perimeter edges extend in the machine direction of the textile fabric.

32. A cleanroom wiper constructed at least partly of a textile fabric
15 formed from a multiplicity of filament containing yarns, the wiper comprising: an interior and plurality of perimeter edges disposed in surrounding relation to the interior wherein at least one of said perimeter edges is characterized by a low discharge of particles under tension such that on average less than about 1000 particles of size greater than or equal to 0.3 microns are generated
20 during a use simulation procedure wherein a substantially untensioned six centimeter segment of said at least one perimeter edge is stretched in a vertical direction within a particle collection environment such that said segment is under a tension of six pounds force, said segment is retained within the particle collection environment in the stretched condition for a
25 period of 2 seconds and said segment is thereafter removed from the particle collection environment prior to relief of the stretched condition.

33. The wiper according to claim 32 wherein at least one of said perimeter edges is characterized by a low discharge of particles under tension
30 such that on average less than about 900 particles of size greater than or equal to 0.3 microns are generated during a use simulation procedure wherein a substantially untensioned six centimeter segment of said at least

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one perimeter edge is stretched in a vertical direction within a particle collection environment such that said segment is under a tension of six pounds force, said segment is retained within the particle collection environment in the stretched condition for a period of 2 seconds and said 5 segment is thereafter removed from the particle collection environment prior to relief of the stretched condition.

34. The wiper according to claim 32 wherein at least one of said perimeter edges is characterized by a low discharge of particles under tension 10 such that on average less than about 800 particles of size greater than or equal to 0.3 microns are generated during a use simulation procedure wherein a substantially untensioned six centimeter segment of said at least one perimeter edge is stretched in a vertical direction within a particle collection environment such that said segment is under a tension of six 15 pounds force, said segment is retained within the particle collection environment in the stretched condition for a period of 2 seconds and said segment is thereafter removed from the particle collection environment prior to relief of the stretched condition.

20 35. The wiper according to claim 32 wherein at least one of said perimeter edges is characterized by a low discharge of particles under tension such that on average less than about 700 particles of size greater than or equal to 0.3 microns are generated during a use simulation procedure wherein a substantially untensioned six centimeter segment of said at least 25 one perimeter edge is stretched in a vertical direction within a particle collection environment such that said segment is under a tension of six pounds force, said segment is retained within the particle collection environment in the stretched condition for a period of 2 seconds and said segment is thereafter removed from the particle collection environment prior 30 to relief of the stretched condition.

36. The wiper according to claim 32 wherein at least one of said

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perimeter edges is characterized by a low discharge of particles under tension such that on average less than about 600 particles of size greater than or equal to 0.3 microns are generated during a use simulation procedure wherein a substantially untensioned six centimeter segment of said at least

- 5 one perimeter edge is stretched in a vertical direction within a particle collection environment such that said segment is under a tension of six pounds force, said segment is retained within the particle collection environment in the stretched condition for a period of 2 seconds and said segment is thereafter removed from the particle collection environment prior
- 10 to relief of the stretched condition.

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